

AMENDMENTS TO THE CLAIMS

Please amend claims 11 and 14 in conformance with the Marked-Up Copy of All Pending Claims that follows. This listing of claims replaces all previous versions and listings of claims in the application.

Marked-Up Copy of All Pending Claims

1. (Original) A composite material assembly for reversibly transferring a gaseous element comprising:

a base-material at least partially coated with a catalyst and at least partially permeable to the gaseous element and defining at least one hollow region for containing the gaseous element.
2. (Original) The composite material of claim 1 wherein transferring the gaseous element comprises releasing and/or storing the gaseous element.
3. (Original) The composite material assembly of claim 1 wherein the catalyst comprises at least one of nickel, palladium, silver, platinum, copper, gold, titanium, silicon, iron, aluminum, indium, gallium, niobium, tantalum, vanadium, molybdenum, tungsten, zirconium, cobalt, chromium, carbon, cadmium, beryllium, rhenium, rhodium, rubidium, or alloys thereof.
4. (Original) The composite material assembly of claim 1 wherein a plurality of composite material assemblies are at least one of sintered or welded together.
5. (Original) The composite material assembly of claim 1 wherein the base-material has a size range of between 5 and 5000 microns.
6. (Original) The composite material assembly of claim 1 wherein the base-material comprises a microbubble.

7. (Original) The composite material assembly of claim 6 wherein the microbubble has a diameter size range between 5 and 5000 microns.
8. (Original) The composite material assembly of claim 6 wherein the microbubble has a wall thickness range between 0.10 and 100 microns.
9. (Original) The composite material assembly of claim 1 further comprising at least one of aluminum, silicon, zirconium, carbon, and boron.
10. (Original) The composite material assembly of claim 1 wherein the base-material comprises a glass.
11. (Amended) The composite material assembly of claim 10 wherein the glass comprises at least one of vitreous silica, vitreous germania, vitreous boric oxide, titanium silicate, aluminosilicate, alkali silicate, alkaline earth silicate, alkaline earth germanate, alkali borate, borosilicate, alkali aluminosilicate, alkali galliosilicate, soda-lime silicate, alkali borosilicate, phosphate, including natural, and commercial grades.
12. (Original) The composite material assembly of claim 1 wherein the base-material comprises a glass-ceramic.
13. (Original) The composite material assembly of claim 12 wherein the glass-ceramic comprises a microbubble.
14. (Amended) The composite material assembly of claim 12 wherein the glass-ceramic comprises at least one of lithium aluminosilicate, lithium silicate, lithium metasilicate, lithium disilicate, zinc silicate, and related commercial ceramic materials.
15. (Original) The composite material assembly of claim 1 wherein the base-material comprises a ceramic.
16. (Original) The composite material assembly of claim 14 wherein the ceramic comprises a microbubble.

17. (Original) The composite material assembly of claim 15 wherein the ceramic comprises at least one of alumina, zirconia, yttria, silica alumina, mullite, sillimanite, porcelain, and a polycrystalline material.

18. (Original) The composite material assembly of claim 1 wherein the coating is formed by a coating process including at least one of chemical vapor deposition, electroplating, electroless plating, sol gel, plasma-activated chemical vapor deposition, sputtering, and painting.

19. (Original) The composite material assembly of claim 1 wherein the permeability is controllably altered by at least one of pressure and temperature.

20. (Original) The composite material assembly of claim 1 wherein a rate of transfer of the gaseous element is enhanced by surface modifications to the coating.

21. (Original) An electrode for reversibly transferring a gaseous element, comprising:

a plurality of composite material assemblies each comprising an at least partially catalyst-coated base-material, the base-material at least partially permeable to the gaseous element and defining at least one hollow region for containing the gaseous element, wherein the plurality of composite material assemblies is at least partially electrically interconnected.

22. (Original) The electrode of claim 21 further comprising a hydrogen-absorbing material interspersed therewith.

23. (Original) The electrode of claim 22 wherein the hydrogen-absorbing material comprises a metal hydride.

24. (Original) The electrode of claim 21 wherein the catalyst coating comprises at least one of nickel, palladium, silver, platinum, copper, gold, titanium, silicon, iron, aluminum, indium, gallium, niobium, tantalum, vanadium, molybdenum, tungsten, zirconium, cobalt, chromium, carbon, cadmium, beryllium, rhenium, rhodium, rubidium, or alloys thereof.

25. (Original) The electrode of claim 21 wherein the plurality of composite material assemblies are at least one of sintered or welded together.

26. (Original) The electrode of claim 21 wherein the composite material assemblies are combined to form a non-sintered matrix.

27. (Original) The electrode of claim 21 wherein the gaseous element is hydrogen.

28. (Original) The electrode of claim 21 wherein the gaseous element is oxygen.

29-79. (Withdrawn)